

SECTION I : SPECIFICATIONS

1. CRT SPECIFICATIONS

Type	A68LBT696X
Trio Pitch	Horizontal: 0.8 mm (Center), 0.9 mm (Edges) Vertical: 0.6 mm
CRT Surface	Anti-Static Coating
Light Transmission	49.0 % approx.
Surface induced voltage	Less than 1.5 kV within 8 seconds after power SW on.

1-1 Limitation of M.P.D.(Missing Phosphor Dots) for CRT

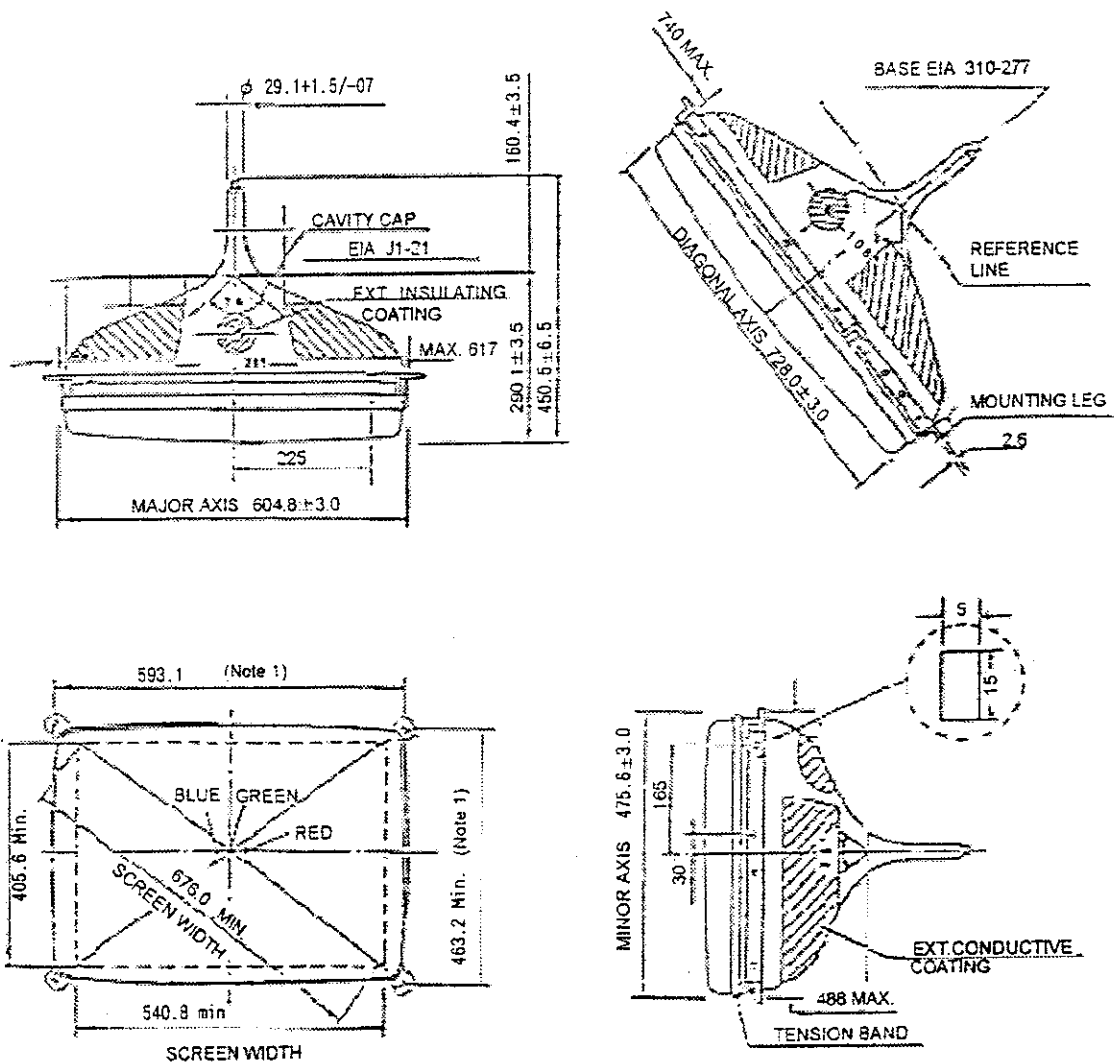
This limitation of M.P.D is applied to the effective screen (phosphor area). In the other screen area, limited are no other defects than scratches preventing the anti-static effective in aluminum foil taped area.

Width (mm)	Max. Length (mm)
less than 0.05	No limit
0.06~0.13	50
0.14~0.20	19
more than 0.21	-

1-2 CRT Dimension

A68LBT696X

Unit: mm



Curvature of the screen

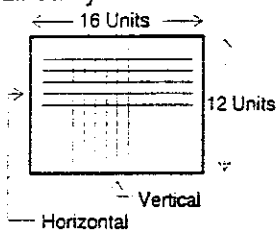
Diagonal: R2390
 Horizontal: R2400
 Vertical: R2440

2. ELECTRICAL SPECIFICATIONS

All measurements are subject to the conditions below, unless otherwise specified.

Input signal	Mode 1: 15.74kHz, ST-V GOLDEN AXE THE DUAL supplied by SEGA Mode 2: 24.39 kHz, Model 3 (24k) supplied by SEGA Mode 3: 31.67 kHz, Model 3 (31k) supplied by SEGA Refer to 2.5 "Recommended signal timing chart".
Brightness	33% window pattern : 60 ft-L, white field pattern : 32 ft-L, black field pattern: 0 ft-L
Magnetic field	BH : 30 μ T, BV : 35 μ T
Measurement	After warm up for at least 30 minutes
Display area size	540 mm x 405 mm
Ambient temperature	20 C°~ 30 C°
Setting conditions	TV style The screen faces the east and the adjustment volumes and switches are in default settings, unless otherwise specified.

2.1 Deflection

Items	Values	Conditions
Scanning Frequency	Horizontal: Mode 1: 15.75 kHz \pm 300Hz Mode 2: 24.4 kHz \pm 500Hz Mode 3: 31.5 kHz \pm 500Hz Vertical: 55 ~ 65 Hz	
Retrace Time	Horizontal: Mode 1, 2: 6.0 μ s max. Mode 3: 5.0 μ s max. Vertical: 1.0 ms max.	
Linearity 	Horizontal: \pm 10 % max. Vertical: \pm 8 % max.	To be measured with Cross-hatch pattern As obtained through following formula. $H = \{ (X \text{ max. or } X \text{ min.}) - (X \text{ Ave.}) \} / (X \text{ Ave.}) \times 100$ $V = \{ (Y \text{ max. or } Y \text{ min.}) - (Y \text{ Ave.}) \} / (Y \text{ Ave.}) \times 100$
Display area size, position	According to 2.7 Adjustment specifications	
Valid display area size	540 mm x 405 mm	
Display ability	Full scan the recommended timing shown 2.6	
Distortion	(a) Trapezoidal: 3.0 % max. (b) Barrel/Pincushion: 3.0 % max. (c) Tilt: 2° max.	To be measured based on JIS-C6101

2.2 Display

Items	Values	Condition
Center Resolution	676 dots x 676 lines	As obtained through following formula. Center Resolution = Display area size / Center phosphor pitch
Video Bandwidth	28.4 MHz typ. (at -3dB)	

2.3 ITC Performance

Items	Values	Condition
Color Purity	Conspicuous different colors shall not be recognizable with Red-field pattern against all directions after the internal degaussing.	To be degaussed in each direction.
Convergence	Max. deviation among RGB raster line center distances, either horizontal or vertical, shall not exceed the following: <ul style="list-style-type: none"> • Within a circle whose diameter is equivalent to 60 % of V. length of CRT: 1.5 mm max. • Within a circle whose diameter is equivalent to vertical length of CRT (excluding the above circle): 2.5 mm max. • Within CRT screen (excluding the above circles) : 3.0 mm max. 	
Jitters	To be invisible from the distance of 50 cm from CRT surface.	
White Balance	x : 0.285 ± 0.02 y : 0.285 ± 0.02 Color Temperature 9700K approx.	To be measured at center of a white-window pattern with Bright VR and Contrast VR in adjusted settings.
Focus	To be adjusted best.	
Maximum brightness	60 ± 10 ft-L	Input signal 0.7 Vp-p To be measured with a white field pattern.

2.4 Power Supply

Items	Values	Condition
Input current and voltage	100-120 VAC ± 10 %, 50/60 Hz	
In-rush current	72 A peak max.	At 132 VAC
Power Consumption	120 ± 18 W	To be measured in default settings with a white field pattern. (The CONTRAST VR is Max.)

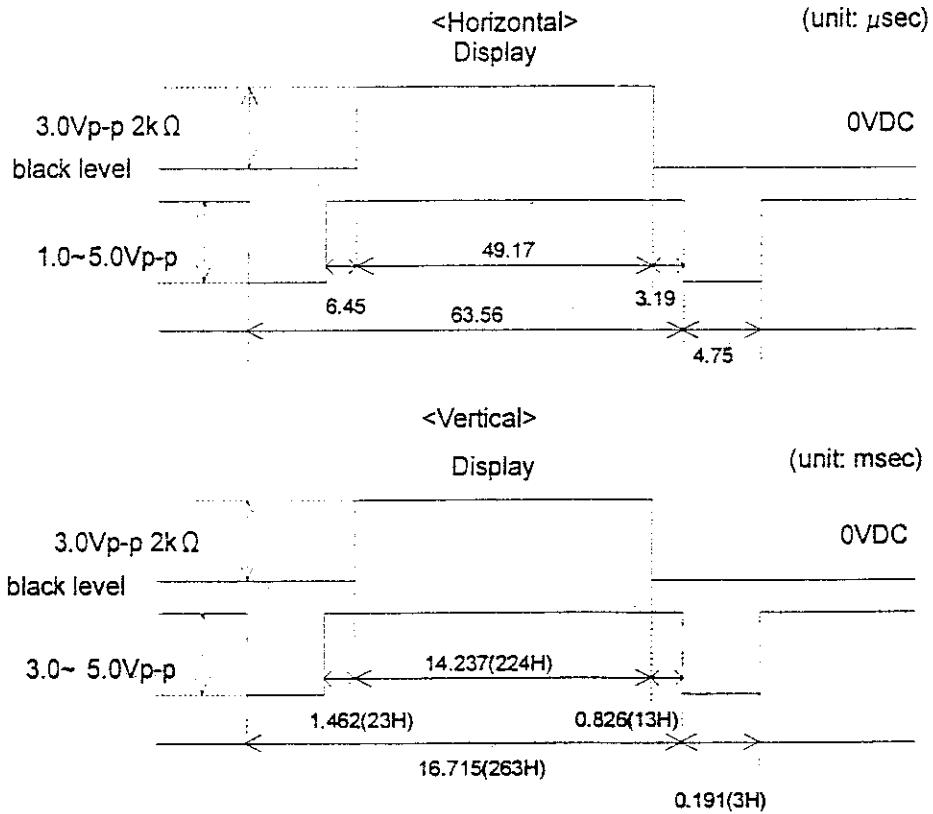
2.5 Signal Input

Sync Input Signal Form	(a) H/V Separate, Positive/Negative (b) H/V Composite, Negative
Video Input Signal Form	AMP UP: analogue, Positive, 3 Vp-p/2k Ω D-Sub : analogue, Positive, 0.7 Vp-p/75 Ω
Scanning	Non-Interlace

2.6 Recommended Signal Timing Chart

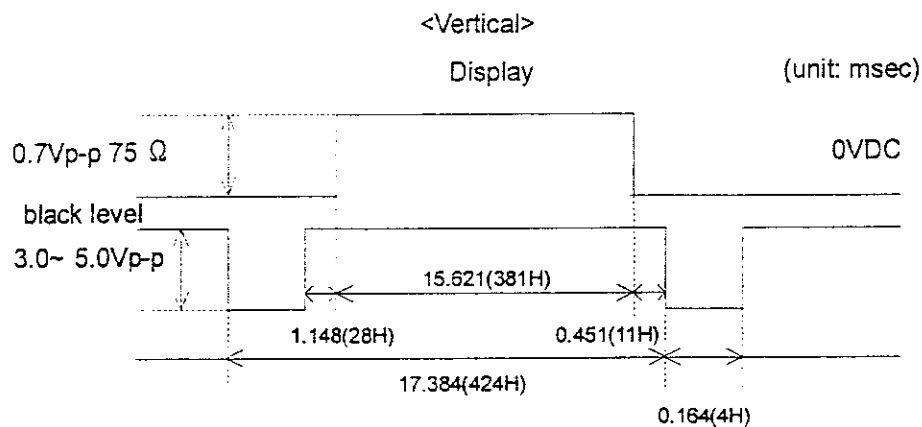
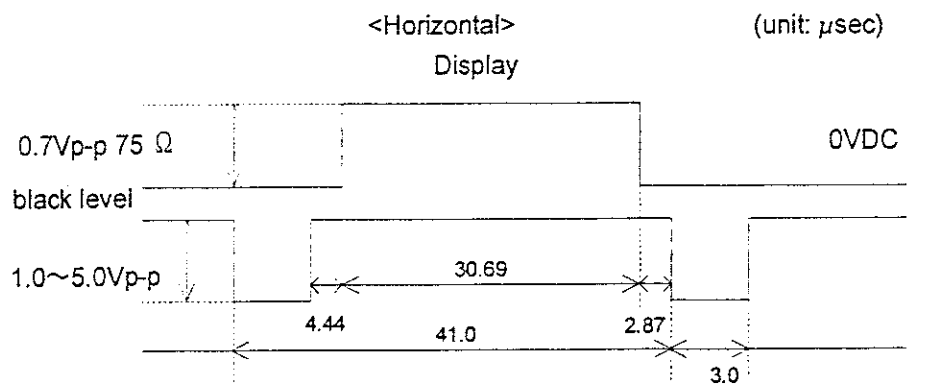
Mode 1

At 15.734 kHz



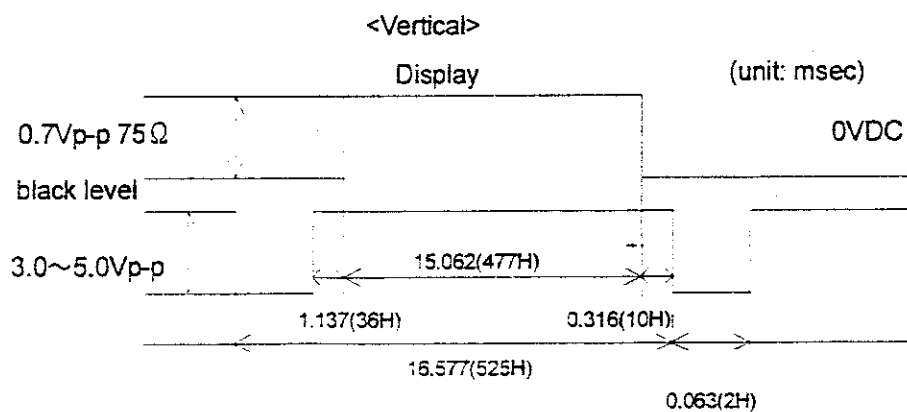
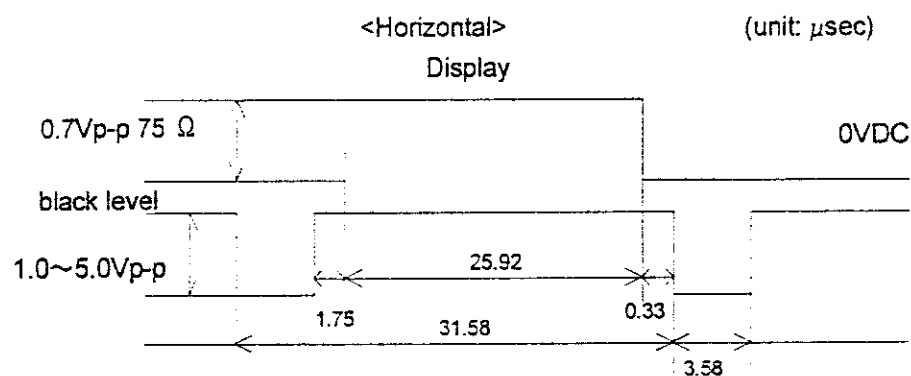
Mode 2

At 24.39 kHz

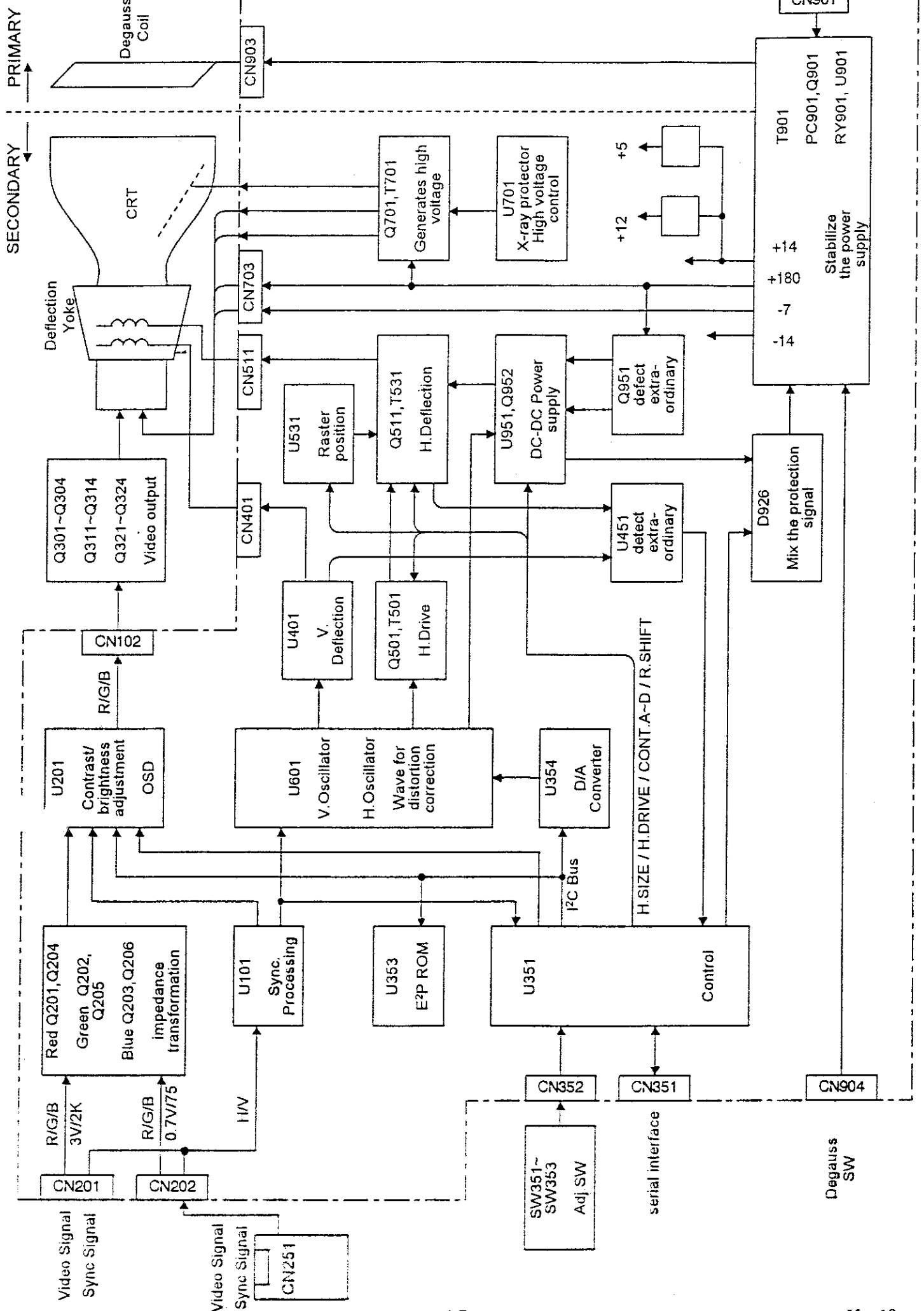


Mode 3

At 31.67 kHz



2.7 Block Diagram



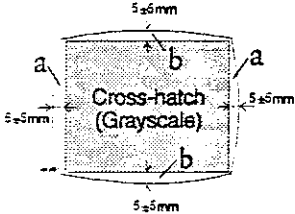
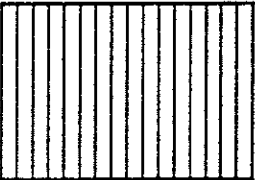
2.8 Adjustment Specifications

2.8.1 Standard signal used for the adjustment

Use the following 3 modes.

- 1) Mode 1: ST-V GOLDEN AXE THE DUAL supplied by SEGA
- 2) Mode 2: Model 3 (24k) supplied by SEGA
- 3) Mode 3: Model 3 (31k) supplied by SEGA

2.8.2 Adjustment Specifications

Items	Values	Conditions
Display Area 	a. Horizontal edges : 5 ± 5 mm b. Vertical edges: 5 ± 5 mm	The screen shall face the east.
Scan Direction	The scanning shall start from left top corner when the monitor is set to face its anode button top.	
Display Position	To be centered.	
White Balance low ← → high  16 grayscale pattern	Conspicuous different white balance shall not be recognizable in low and high brightness part with 16 grayscale pattern. Low brightness level (1 st gradation part) : 0	
Others	100% scanned in each signal. No extraordinary in each pattern.	

3. MECHANICAL SPECIFICATIONS

3.1 Adjustment Functions (Please refer to Section III for the detail.)

3.1.1 PCB-SW The Function Key adjustment (OSD: On Screen Display)

- Vertical Position Adjustment (V.POSI)
- Horizontal Position Adjustment (H.POSI)
- Vertical Size Adjustment (V.SIZE)
- Horizontal Size Adjustment (H.SIZE)
- Contrast Adjustment (CONTRAST)
- Brightness Adjustment (BRIGHT)
- Degaussing function (DEGAUSS)
- Reset (RESET)

3.1.2 PCB-MAIN

- Switching the polarity of Deflection Yoke
- Focus Adjustment (FOCUS)

Do not adjust above volumes except the authorized service personnel.

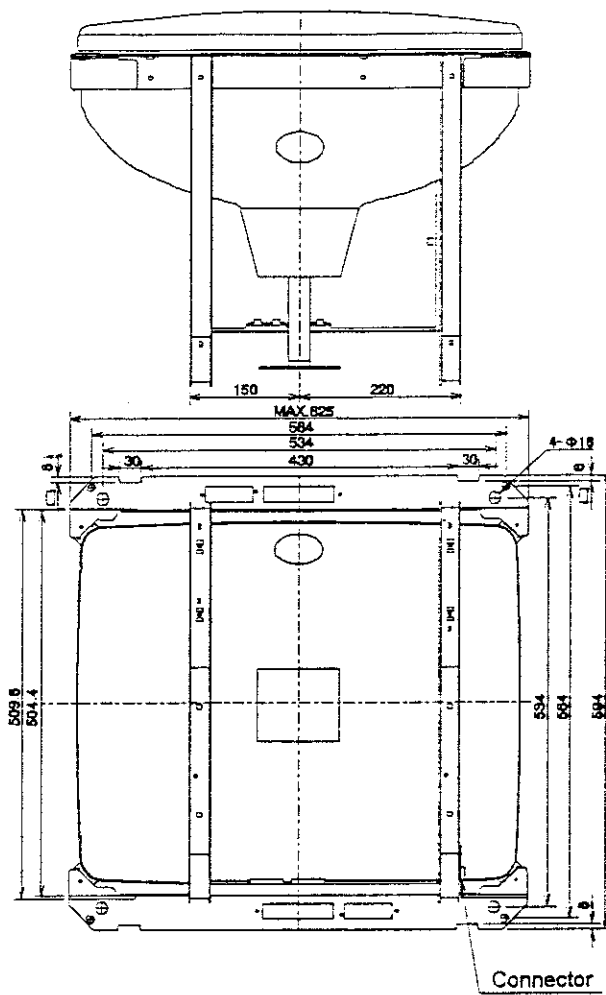
3.2 Configuration

NOTE: All of the dimensions, weights and angles below are reference values.

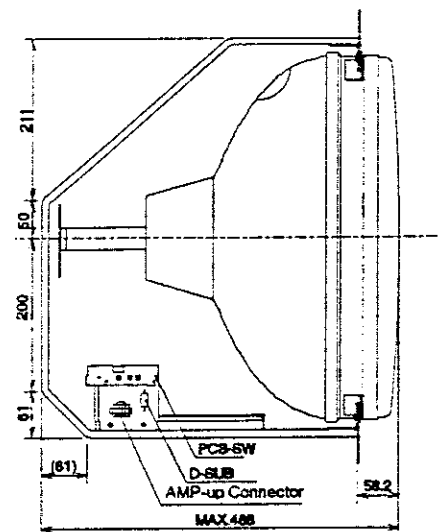
Dimensions (net)	625 mm (W) x 594 mm (H) x 488 mm (D)
Weight (net)	approx. 40.0 kg
Outline drawing	Refer to the below.

top

Unit:mm (±3mm)



Rear



Side

3.3 Packing specifications (unit package)

NOTE: All of the dimensions and weight below are reference values.

Packing dimensions	756 mm (W) x 606 mm (H) x 728 mm (D)
Packing weight	approx. 45.0 kg
Stack limit	3 units (Maximum)
Packing drawing	Refer to page I-17.

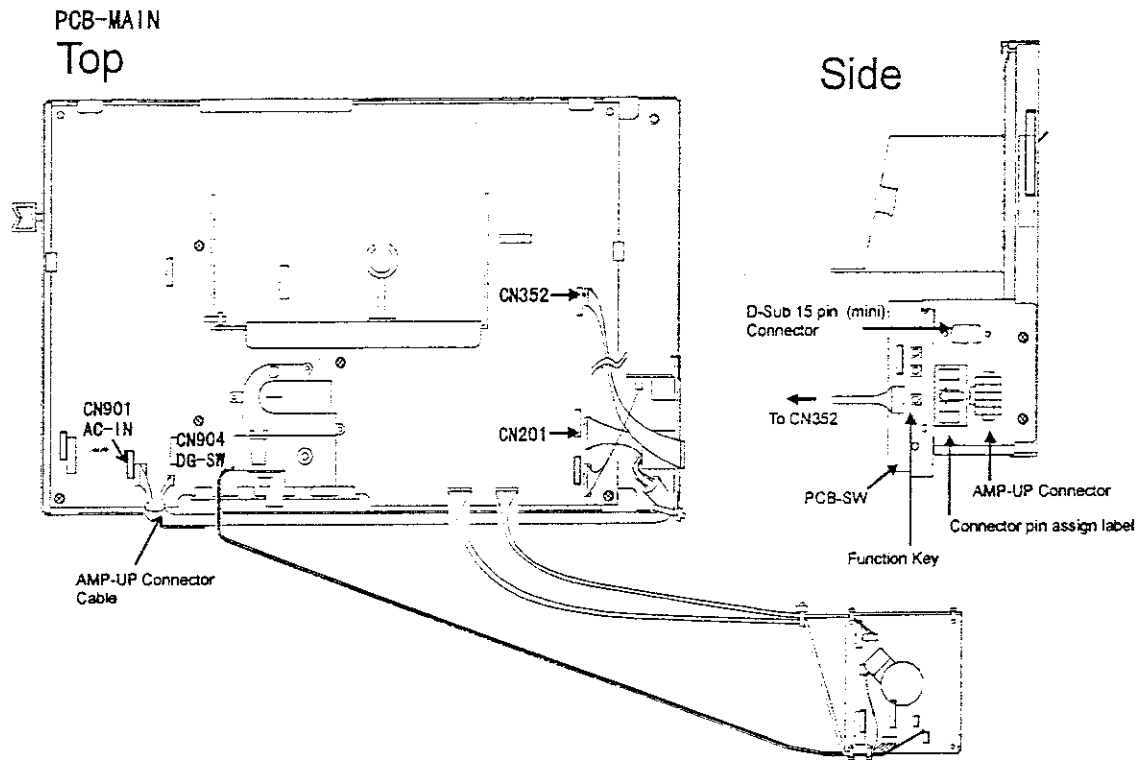
3.4 Packing specifications (pallet package)

NOTE: All of the dimensions and weight below are reference values.

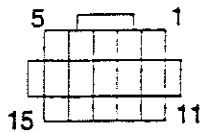
Packing dimensions	1090 mm (W) x 670 mm (H) x 850 mm (D)
Packing weight	approx. 108.0 kg
Stack limit	2 units (Maximum)

3.5 Connector Specifications

3.5.1 Connector Location

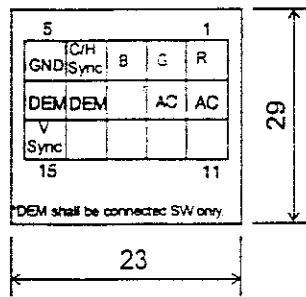


3.5.2 AMP UP Connector (176300-1)

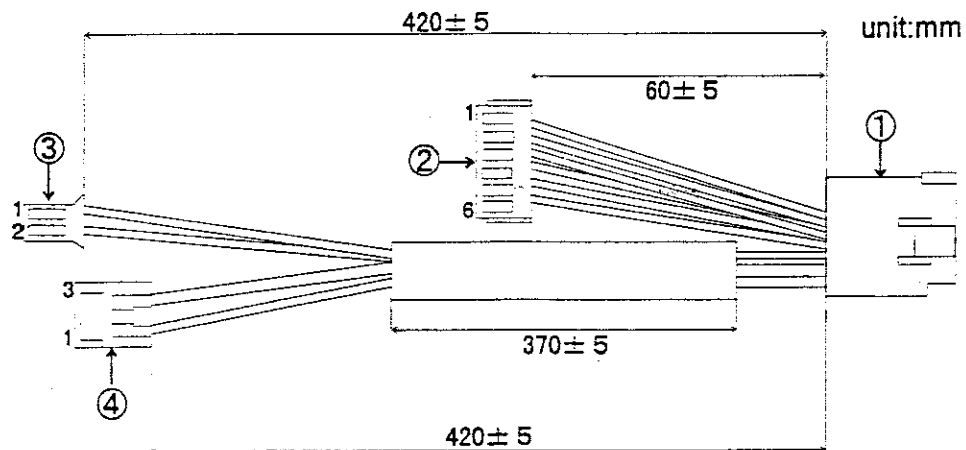


	Input Signal	Description
1	Red Video	Positive, 3Vp-p, Input imp. 2 k Ω
2	Green Video	Ditto
3	Blue Video	Ditto
4	H. Sync or H/V	Positive/Negative H. Sync 3~5 Vp-p Negative composite sync. 1~5 Vp-p
5	GND	GND
6	AC Power Supply	100~120VAC \pm 10%, 50/60 Hz
7	AC Power Supply	100~120VAC \pm 10%, 50/60 Hz
8	N.C (No Connection)	-
9	DEM	SW shall be connected between 9pin and 10 pin.
10	DEM	SW shall be connected between 9pin and 10 pin.
11	N.C	-
12	N.C	-
13	N.C	-
14	N.C	-
15	V.Sync. Signal	Posi/Nega V. sync 3~5 Vp-p

Connector Pin Assignment Label

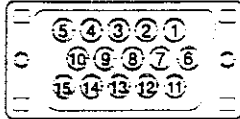


AMP UP Connector



① UP Connector	② HER-6(connecting to CN201)
1 ②-6 Red	1 ①-15 Brown
2 ②-5 Green	2 ①-4 Gray
3 ②-4 Blue	3 ①-5 White
4 ②-2 Gray	4 ①-3 Blue
5 ②-3 White	5 ①-2 Green
6 ④-1 black	6 ①-1 Red
7 ④-3 White	③ PHR-2 connecting to CN904
9 ③-1 Red	1 ①-9 Red
10 ③-2 Orange	2 ①-10 Orange
15 ②-1 Brown	④ VHR-3 connection to CN901
	1 ①-6 Black
	3 ①-7 White
8, 11~14pin Open	2pin Open

3.5.3 D-SUB 15 pin (mini) Connector



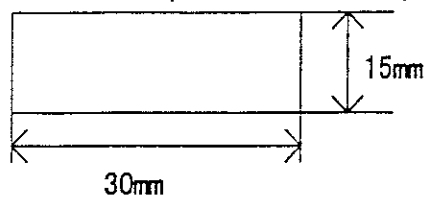
	Input Signal	Description
1	Red	Positive, 0.7Vp-p/75Ω
2	Green	Positive, 0.7Vp-p/75Ω
3	Blue	Positive, 0.7Vp-p/75Ω
4		
5	GND	GND
6	Red GND	GND
7	Green GND	GND
8	Blue GND	GND
9		
10	GND	GND
11		
12		
13	H.Sync or Composite Sync	Positive/Negative, Separate Sync, 3~5Vp-p Negative, Composite Sync, 1~5Vp-p
14	V.Sync	Positive/Negative, Separate Sync, 3~5Vp-p
15		

3.6 Conductive Aluminum Foil Tape Specifications

3.6.1 Name

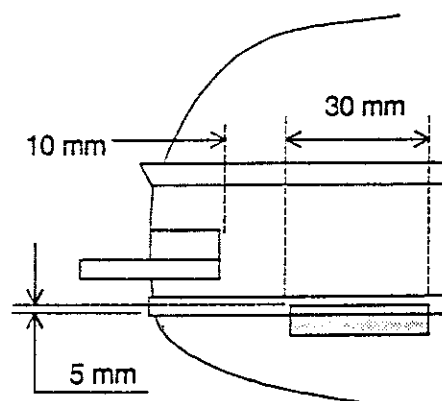
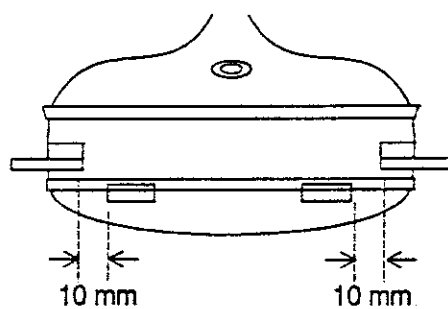
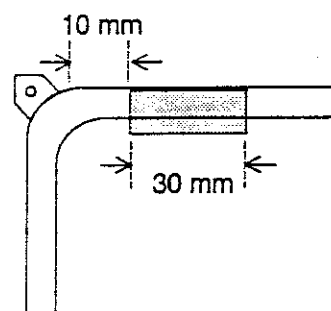
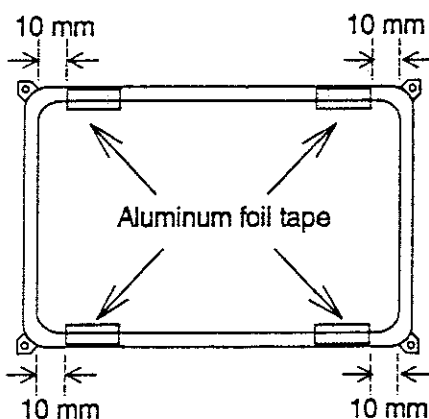
TERAOKA 830

3.6.2 Dimension (reference values)



3.7.3 Taping

The aluminum foil tapes are put on to keep the surface of the panel and the integral implosion protection metal band conductive as follows (Since no problem is found in the mechanical and electrical performance.);



4. CERTIFICATIONS & STANDARDS

4.1 Certifications

Standard	Origin	Category				Marking
		Safety	EMC	Ergonomic	Other	
S-JQA	Based on Electrical Appliance & Material Control law (The 3 rd clause, Table No.8 "applied apparatus")	✓				Name plate
TÜV	EN60950: 1991+A1+A2+A3	✓				Name plate
CB	IEC60950: 1992+A1+A2+A3	✓				
UL	UL 1950 2 nd	✓				Name plate
C-UL	CSA C22.2 No. 950 2 nd	✓				Name plate
DHHS (DNHW)					✓ (X-ray)	
PTB*					✓ (X-ray)	

4.2 Standards (excluding Video components)

Standard	Category				Marking
	Safety	EMC	Ergonomic	Other	
VCCI Class A		✓			
FCC Class A		✓			

INSTALLATION INSTRUCTION FOR SAFETY REQUIREMENT

The monitor should be installed in following condition in order to meet the requirement of safety standard EN60950: 1992+A1+A2+A3+A4+A11

1. Power Supply

- a) The transformer which has double or reinforced insulation should be used between primary power source and the monitor.
- b) The rating of input power supply voltage should be 100-120Vac \pm 10%.

2. Ambient temperature

The ambient temperature around the monitor should be less than 40°C.

5. RELIABILITY & SAFETY

5.1 Reliability

MTBF	20,000 hours at standard power input excluding CRT. *Values calculated according to the simplified "Parts Count Reliability Prediction" method as specified in MIL- HDBK-217F.
AC line noise resistance	No synchronized condition shall be detected when applying 500Vp-p pulse by using a noise simulator.

5.2 Safety Aspect

Undesired radiation	Less than 0.1 mR/hour (1 μ Sv/H) at 10 cm distance.
High voltage label	To be pasted on the followings. <ul style="list-style-type: none"> • Top of the anode cap • The anode lead • The focus and screen lead • The DY lead

6. OPERATING ENVIRONMENT SPECIFICATIONS

Ambient Temperature		Operation: 0 °C~40 °C Storage : -10 °C~60 °C (The inner temperature of the amusement machine should be designed below 40°C.)
Ambient Humidity		Operation: 70 % R.H. max. Non condensing Storage: 80 % R.H. max. Non condensing
Altitude		Operation: up to 3,000 m Shipping or Storage: up to 12,000 m
Vibration	(Ass'y chassis unit)	To be free from any damage to the circuits nor the appearance on 1 hour 1 G vibration test to be carried out under 5~100~5 Hz varying frequencies in every 10 minutes. To be validated along all three axes.
	(Face-up)	To be free from any damage to the CRT on 1 hour 0.5 G vibration test to be carried out under 5~100~5 Hz varying frequencies in every 10 minutes. To be validated along the axes of the CRT.
	(Unit package)	To be free from any damage on 30 minutes 1 G vibration test to be carried out under 5~100~5 Hz varying frequencies in every 10 minutes. To be validated along all three axes.
	(Pallet package)	To be free from any damage on 40 minutes (or 1 hour in up-down vibration only) 0.5 G vibration test to be carried out under 5~100~5 Hz varying frequencies in every 10 minutes. To be validated along all three axes.
Drop Test	(Unit package)	To be free from any damage on free drop from 40 cm height once.
	(Pallet package)	To be free from any damage on free drop from 15 cm height and on drop with support (10 cm) from 15 cm height once.

7. PACKAGING SPECIFICATIONS

7.1 Unit package

